semiconductor film through said transparent substrate,

wherein an energy density E of each of said laser pulses in unit of mJ/cm^2 and the number N of said laser pulses satisfy relation $\log_{10} N \le -0.02(E-350)$.

Fig.7(A) shows the introducing step, and Fig.7(B) shows the irradiating step. Reference numeral 71 designates the transparent substrate, and 72 designates the semiconductor film.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a schematic view of a laser annealing apparatus having used in the embodiments of the present invention;

FIG. 2 is a graph showing the relationship between the sheet resistance of a silicon film (phosphorus-doped, N-type) obtained by laser annealing according to an embodiment of the present invention and the applied laser energy density, while changing the repetition times of pulse shots;

FIG. 3 is a graph showing the relationship between the sheet resistance of a silicon film (phosphorus- and boron-doped, P-type) obtained by laser annealing according to an embodiment of the present invention and the applied laser energy density, while changing the repetition times of pulse shots;

FIG. 4 is a graph showing the relation between the morphology of the silicon film obtained in an embodiment of the present invention and the applied laser energy density and the repetition times of the pulse shots;

Fig.5 shows a concept of an optical system of the laser annealing apparatus having used in the embodiments of the present invention;

Fig.6 shows a laser annealing process in accordance with the present invention; and

Fig.7 shows another laser annealing process in accordance with the present invention.

6A-6D Brief Description 7A-7B